

IN THE CLAIMS:

Please amend Claims 71, 75, 79, 82 and 86 and add Claim 89 as follows. All claims currently pending in this application have been reproduced below.

Claims 1- 70 (cancelled).

71. (Currently Amended) A diffractive optical element, which is used for an optical system of an exposure apparatus, said diffractive optical element comprising:

an effective area;

a peripheral area surrounding the effective area;

a light-shielding member composed of a laminated layer of Cr oxide and Cr disposed on a surface of the peripheral area;

a holding frame,

wherein the laminated layer includes an alignment mark at a predetermined position with respect to the center of the effective area and in relation to the holding frame for centering-so as to center the effective area in the holding frame.

72. (Cancelled)

73. (Previously Presented) An exposure apparatus for exposing a wafer to a pattern of a mask by using said optical system including said diffraction grating optical element according to Claim 71.

74. (Previously Presented) A device manufacturing method comprising:
a step of exposing a wafer to a device pattern of a mask by the exposure apparatus according to Claim 73; and
a step of developing the exposed wafer.

75. (Currently Amended) A diffractive optical element, which is used for an optical system of an exposure apparatus, said diffractive optical element comprising:
an effective area;
a peripheral area surrounding the effective area;
a light-shielding member composed of a material selected from the group consisting of TiC, TiN, ZrC, HfC and HfN, disposed on a surface of the peripheral area; and
a holding frame,
wherein the material disposed on the surface of the peripheral area includes an alignment mark ~~for centering~~ at a predetermined position with respect to a center of the effective area and in relation to the holding frame so as to center the effective area in the holding frame.

76. (Cancelled)

77. (Previously Presented) An exposure apparatus for exposing a wafer to a pattern of a mask by using said optical system including said diffractive optical element according to Claim 75.

78. (Previously Presented) A device manufacturing method comprising:
a step of exposing a wafer to a device pattern of a mask by the exposure apparatus according to Claim 77; and
a step of developing the exposed wafer.

79. (Currently Amended) A diffractive optical element, which is used for an optical system of an exposure apparatus, said diffractive optical element comprising:
an effective area;
a peripheral area surrounding the effective area;
a light-shielding member composed of an acrylic or epoxy light-shielding ink disposed on a face of the peripheral area; and
a holding frame,
wherein the light shielding member comprises an alignment mark ~~for centering at a predetermined position with respect to a center of the effective area and in relation to the holding frame so as to center~~ said effective area in the holding frame, and said light-shielding ink is not exposed to an outside of the diffractive optical element.

80. (Previously Presented) An exposure apparatus for exposing a wafer to a pattern of a mask by using said optical system including said diffractive optical element according to Claim 79.

81. (Previously Presented) A device manufacturing method comprising:
a step of exposing a wafer to a device pattern of a mask by the exposure apparatus according to Claim 80; and
a step of developing the exposed wafer.

82. (Currently Amended) A diffractive optical element, which is used for an optical system of an exposure apparatus, said diffractive optical element comprising:
an effective area;
a peripheral area surrounding the effective area;
a light-shielding member composed of any one of (i) chromium, aluminum, molybdenum, tantalum and tungsten, (ii) a laminated structure of any one of chromium, aluminum, molybdenum, tantalum or tungsten and any one of chromium oxide, silicon oxide or aluminum oxide, (iii) a compound material of a metal and silicon, and (iv) a compound of any one of molybdenum or tungsten and silicon, silicon, or titanium oxide, disposed on a face of the peripheral area; and
a holding frame,
wherein said light-shielding member comprises an alignment mark ~~for centering at a predetermined position with respect to a center of the effective area and in relation to the holding frame so as to center~~ the effective area in the holding frame.

83. (Previously Presented) A diffractive optical element according to Claim 82, wherein a wavelength of light used for the exposure is less than 250 nm.

84. (Previously Presented) An exposure apparatus for exposing a wafer to a pattern of a mask by said optical system including said diffractive optical element according to Claim 82.

85. (Previously Presented) A device manufacturing method comprising:
a step of exposing a wafer to a device pattern of a mask by the exposure apparatus according to Claim 84; and
a step of developing the exposed wafer.

86. (Currently Amended) A diffractive optical element comprising:
an effective area;
a peripheral area surrounding the effective area;
a light-shielding member disposed on a surface of the peripheral area; and
a holding frame,
wherein said light-shielding member comprises an alignment mark ~~for~~
centering at a predetermined position with respect to a center of the effective area and in relation to the holding frame so as to center the effective area in the holding frame.

87. (Previously Presented) An exposure apparatus for exposing a wafer to a pattern of a mask by using an optical system including a diffractive optical element according to Claim 86.

88. (Previously Presented) A device manufacturing method comprising:
a step of exposing a wafer to a device pattern of a mask by using an exposure apparatus according to Claim 87; and
a step of developing the exposed wafer.

89. (New) A method for manufacturing a diffractive optical element according to Claim 71, comprising the steps of:
coating a substrate with photoresist;
patterning the photoresist into a pattern for making the alignment mark and a pattern for making the effective area;
etching the substrate covered with the patterned resist;
peeling the photoresist;
forming the light-shielding member and the alignment mark by forming a laminated layer of Cr oxide and Cr on the peripheral area of the substrate; and
attaching the substrate to the holding frame.